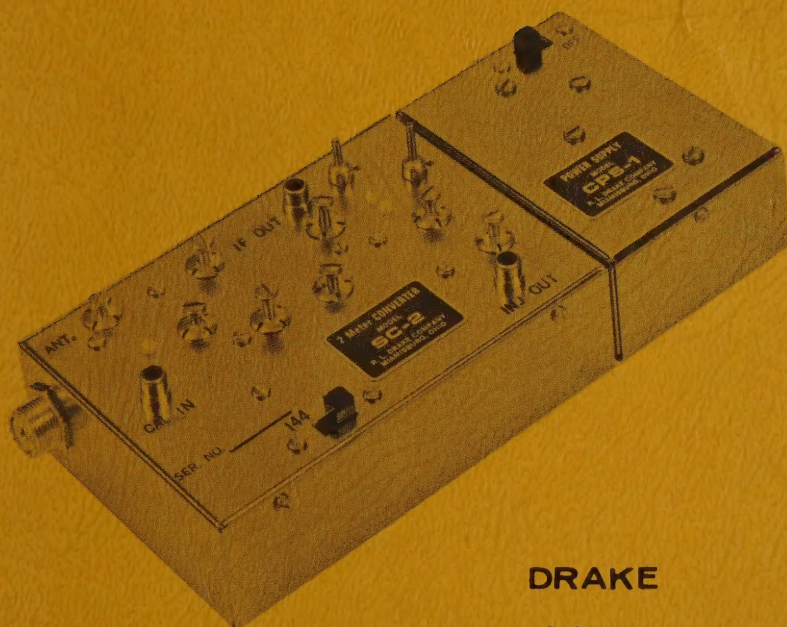


# INSTRUCTION MANUAL



DRAKE

MODEL

# SC-2

## 2 Meter Converter

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## DRAKE MODEL SC-2 CONVERTER

### SPECIFICATIONS

Frequency Range	144 - 148 MHz
I.F. Range	14 - 18 MHz
Power	15 - 18 Volts DC at 40 ma
Input Impedance	50 ohms
Output Impedance	50 ohms
Image Rejection	75 dB at 115.5 MHz
I.F. Rejection	75 dB at 14 MHz
Gain	20 dB Typical
Gain Variation	$\pm$ .5 dB between 144.0 and 148.0 MHz
Noise Figure	Typically 2.0 dB
Frequency Tolerance	.001%

### SEMICONDUCTOR COMPLEMENT

One TIS88	R.F. Amplifier
One TIS88	Mixer
One 2N3394	Oscillator
One 2N3663	Frequency Tripler
One 1N714	Zener Regulator
One 1N4148	Reverse Polarity Protection



## CIRCUIT DESCRIPTION

The SC-2 Converter consists of an unilateralized grounded source FET radio frequency amplifier (Q2), a grounded source FET mixer (Q4), a series resonant 43 MHz crystal-controlled oscillator (Q1), and a frequency tripler (Q3).

The signal from the antenna is matched into the gate of Q2 via a tuned circuit comprised of L2 and C5. A portion of the drain signal of Q2 is fed back to its gate through C6 for neutralization. C13 is used to adjust the magnitude of the feedback. The bulk of the drain signal of Q2 passes through a bandpass network to the gate of mixer Q4. The local oscillator signal is coupled into the source of Q4.

The difference frequency (14 to 18 MHz) appearing at the drain terminal of Q4 is matched to the 50 ohm output by the bandpass network formed by L10, C30, C33, C34 and L11.

## INJECTION

Approximately 200 millivolts of 43 MHz signal is available at the INJ. socket for use with a transmitting mixer. Connection of a load to the INJ. socket may necessitate realignment of L4.  
(See Page 4)

## CALIBRATION

A signal level of approximately 5 microvolts applied to the CAL. socket is adequate for calibration of the SC-2.

## OPERATION

Connect a 2 meter antenna to the ANT. socket of the SC-2, connect the receiver antenna terminals to the IF OUT socket of the SC-2 with RG/58/U coaxial cable, and connect a source of 15 - 18 volts DC to the power plug of the SC-2. The cable between the SC-2 and the receiver should be kept as short as possible, and a short ground strap should connect the two chassis, in order to minimize 14 MHz interference.

Set the slide switch on the SC-2 to 144. 144 MHz signals will be received with the receiver tuned to 14 MHz. Changing the slide switch to 145 position selects an alternate local oscillator crystal, and allows reception of 145 MHz signals with the receiver tuned to 14 MHz.

## ALIGNMENT

Alignment of the SC-2 Converter requires precision equipment and a working knowledge of bandpass alignment procedures. The minimum equipment required for satisfactory alignment includes a sweep generator, a sensitive oscilloscope, a signal generator with a calibrated attenuator (such as the Hewlett-Packard 608-D), a marker generator, a video detector, and 50 ohm attenuators to properly terminate the input and output circuits of the converter.

Any attempt at peaking the adjustments on a signal will result in the destruction of the 4 MHz band-pass characteristic.

The converter may be returned to the factory for alignment for a fixed charge of \$5.00 plus postage. The factory alignment procedure is available upon request.

Alignment of the local oscillator injection system (L4, C26 and C27) may be accomplished without affecting the bandpass alignment of the converter. These elements are adjusted so that the gain of the converter is the same with the slide switch in either the 144 or 145 position (See Figure 1, Page 6).

### ACCESSORIES

Accessories available for use with the SC-2 include a matching power supply (Model CPS-1), a VHF calibrator (Model SCC-1), and a converter mounting console (Model CC-1). The CC-1 has provisions for mounting the CPS-1, the SCC-1, the SC-2, the SC-6 6 meter converter, and a spare position for an extra converter. These accessories are available from your dealer.

### OPERATION WITH R-4B AND 2-C RECEIVERS

Table 1, Page 5, gives the combination of receiver crystals, I.F. tuning range, and 2 meter input frequencies for use with the R-4B and 2-C Receivers.

### FM INTERFERENCE

The tunable FM trap which consists of L1 and C4 may be used to reject interference from strong FM stations. Adjust C4 for minimum interference.



		144.0	145.0	2 METER BAND (MHz)		146.0	147.0	148.0
CONVERTER SWITCH	144	RECEIVER FREQUENCY (MHz)	14.0-14.5	14.5-15.0		16.0-16.5	16.5-17.0	
		R-4B CRYSTAL (MHz)	25.1*	25.6*		27.1	27.6	
145		RECEIVER FREQUENCY		14.0-14.5	14.5-15.0		16.0-16.5	16.5-17.0
		R-4B CRYSTAL (MHz)		25.1*	25.6**		27.1	27.6

NOTE: \*The 25.1 MHz crystal, supplied with the R-4B Receiver, covers 144-144.5 MHz and 145-145.5 MHz.

\*\*The 25.6 MHz crystal along with the 25.1 MHz crystal covers 144 to 146 MHz.

Auxiliary crystals 27.1 and 27.6 MHz, along with the 25.1 and 25.6 MHz crystals will cover the entire 2 meter band.

# FOR DRAKE MODEL R-4B RECEIVER

		144.0	145.0	2 METER BAND (MHz)		146.0	147.0	148.0
CONVERTER SWITCH	144	RECEIVER FREQUENCY (MHz)	14.0-14.5	14.5-15.0		16.0-16.5	16.5-17.0	
		2-C CRYSTAL (MHz)	18.0*	18.5*		20.0	20.5	
145		RECEIVER FREQUENCY		14.0-14.5	14.5-15.0		16.0-16.5	16.5-17.0
		2-C CRYSTAL (MHz)		18.0*	18.5**		20.0	20.5

NOTE: \* The 18.0 MHz crystal, supplied with the 2-C Receiver, covers 144-144.5 MHz and 145-145.5 MHz.

\*\* The 18.5 MHz crystal, along with the 18.0 MHz crystal covers 144 to 146 MHz.

Auxiliary crystals, 20.0 and 20.5 MHz, along with the 18.0 and 18.5 MHz crystals will cover entire 2 meter band.

# FOR DRAKE MODEL 2-C RECEIVER

TABLE I  
FREQUENCY READOUT CHART

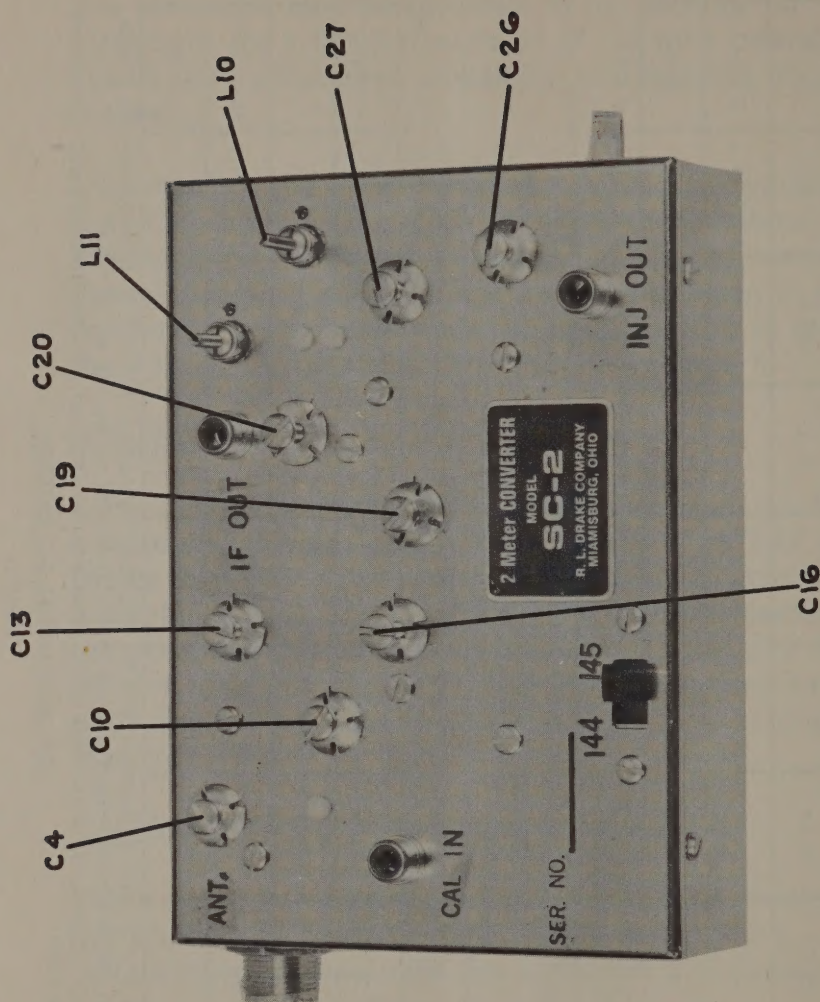
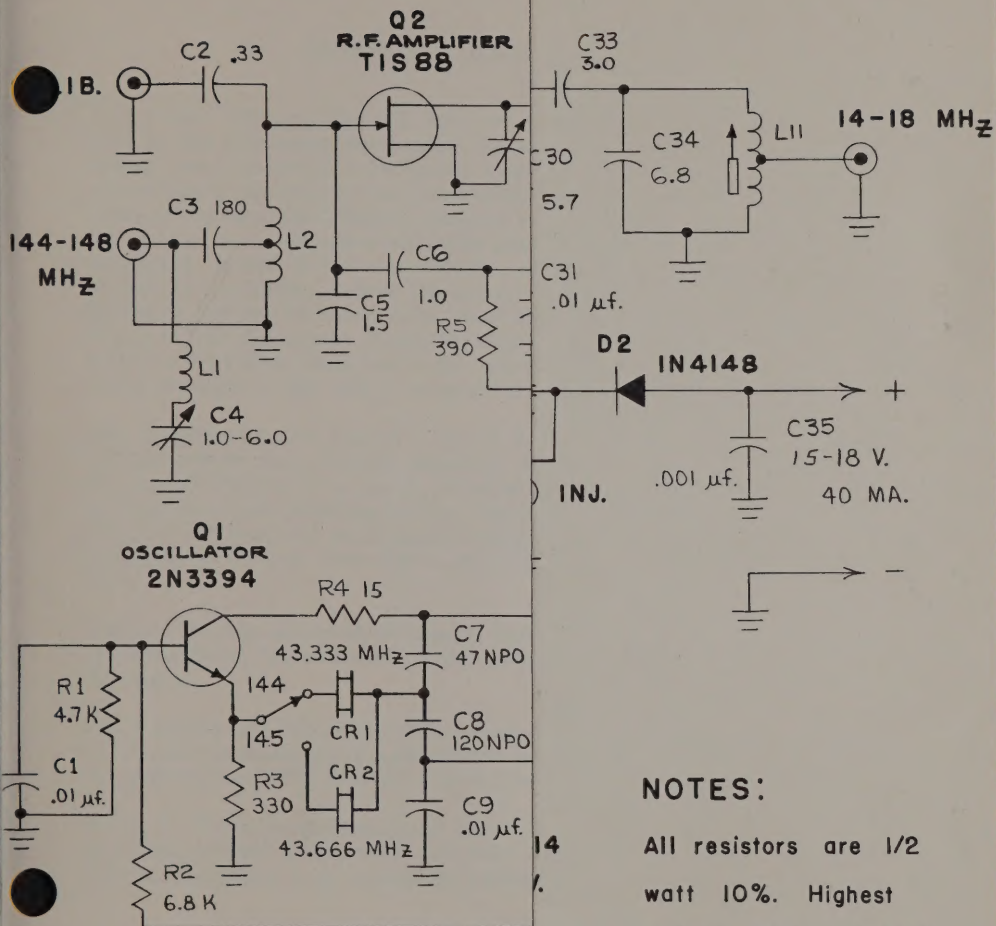


FIGURE 1  
TUNING CONTROLS





## NOTES:

All resistors are 1/2 watt 10%. Highest resistor R17. Highest capacitor C35. All capacitors are in pf unless otherwise noted.

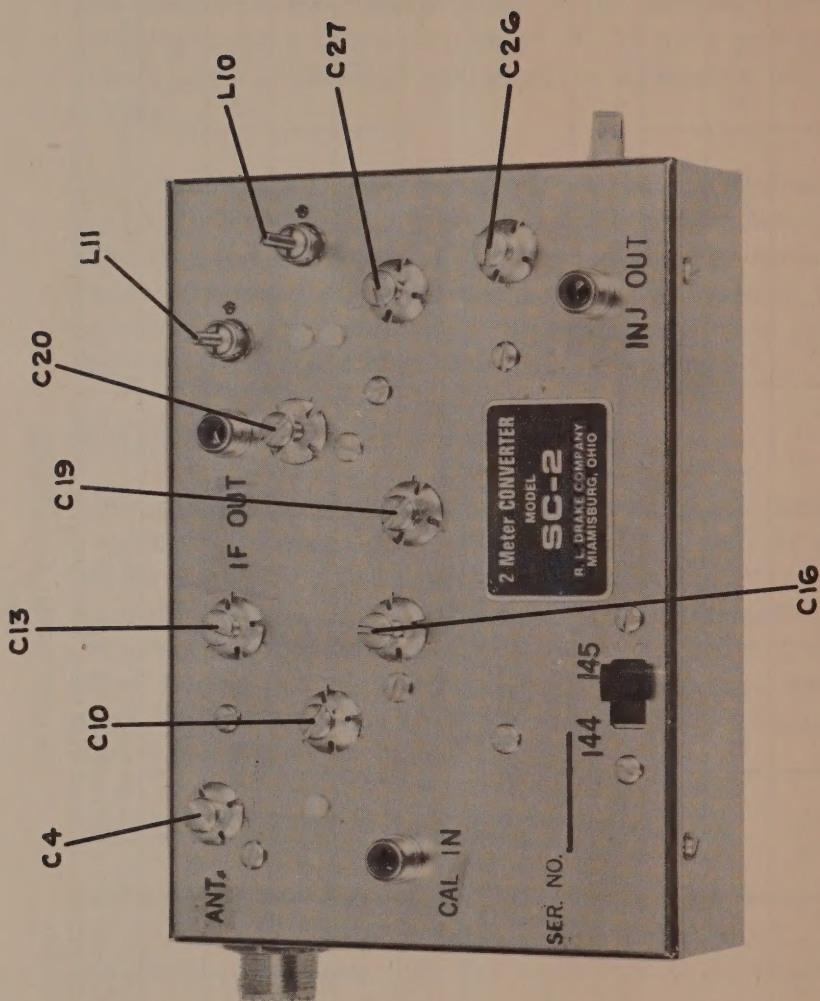
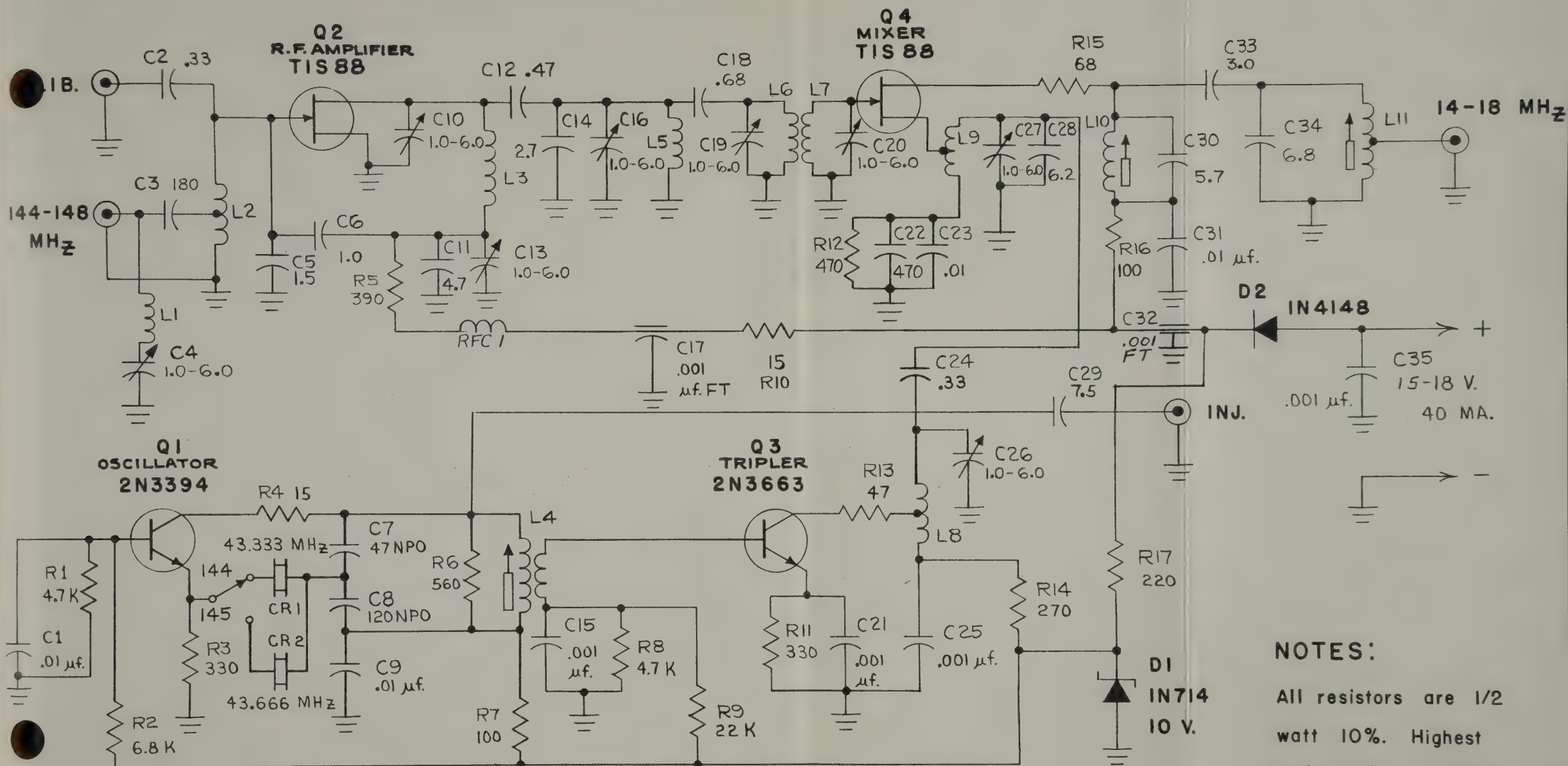


FIGURE 1  
TUNING CONTROLS

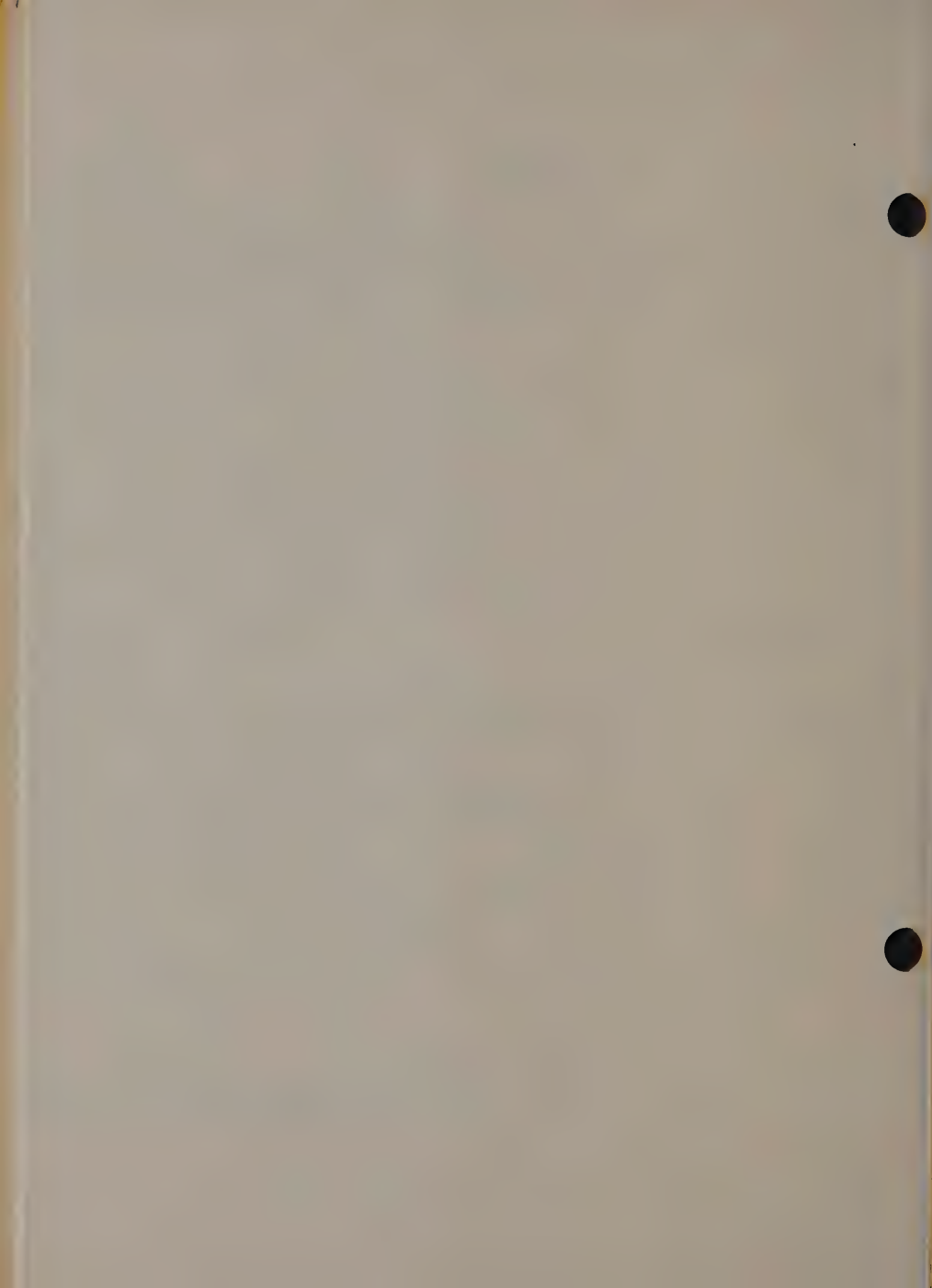


SCHEMATIC DIAGRAM MODEL SC-2 CONVERTER

# NOTES:

All resistors are 1/2 watt 10%. Highest resistor R17. Highest capacitor C35. All capacitors are in pf unless otherwise noted.





## STANDARD WARRANTY

R. L. Drake Company warrants each new radio product manufactured by it to be free from defective material and workmanship and agrees to remedy any such defect or to furnish a new part in exchange for any part of any unit of its manufacture which under normal installation, use, and service discloses such defect, provided the unit is delivered by the owner to us or to our authorized radio dealer or wholesaler from whom purchased, intact, for our examination, with all transportation charges prepaid to our factory, within ninety days from the date of sale to original purchaser and provided that such examination discloses in our judgement that it is thus defective. Should a malfunction be suspected, write in detail to our Service Department for suggestions concerning the operation, repair or return of your unit if it should prove necessary.

This warranty does not extend to any of our radio products which have been subjected to misuse, neglect, accident, incorrect wiring not our own, improper installation, or to use in violation of instructions furnished by us, nor extend to units which have been repaired or altered outside our factory, nor in cases where the serial number thereof has been removed, defaced or changed, nor to units used with accessories not manufactured or recommended by us.

Any part of a unit approved for remedy or exchange hereunder will be remedied or exchanged by the authorized radio dealer or wholesaler without charge to the owner.

This warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our radio products.

The R. L. Drake Company reserves the right to make any improvements to its products which it may deem desirable without obligating itself to install such improvements in its previously manufactured products.





Place  
Stamp  
Here

**R. L. DRAKE CO.**  
**540 RICHARD STREET**  
**MIAMISBURG, OHIO 45342**

SERIAL NO. \_\_\_\_\_

MODEL

SC-2

R. L. DRAKE CO. WARRANTY REGISTRATION

NAME \_\_\_\_\_

CALL \_\_\_\_\_

ADDRESS \_\_\_\_\_  
\_\_\_\_\_

DEALER'S NAME \_\_\_\_\_

SALESMAN \_\_\_\_\_

DATE OF PURCHASE \_\_\_\_\_

(return promptly)

COMMENTS:

COMPOSITE SPARE PARTS LIST FOR:  
SC2/6, TC2/6, SCC-1, CPS-1 & CC-1

February 1, 1971  
 Prices subject to change  
 without notice

QTY	SYMBOL	USED ON	ITEM	PRICE EACH
1	-----	TC2/6	Cable, power, 4 ft., 12 cond/connectors	\$ 7.50
1	-----	TC2/6	Cable, RG-8, 4 ft., with 1-type N & 1 PL259	4.50
2	-----	TC2/6	Cable, RG58, 4 ft., with phono connectors	1.35
2	-----	TC2/6	Cable, audio, 4 ft., with phono connectors	1.20
6	-----	CC-1	Cable, RF, with 1 phono connector, 7"	.50
1	-----	TC-2	Cabinet, with feet	12.50
1	-----	TC-6	Cabinet, with feet	12.50
1	C78	TC-2	Capacitor, Variable, Load	2.25
1	C74	TC-2	Capacitor, Variable, Tune	10.50
1	C42	TC-2	Capacitor, Variable, Drive 3-8	2.00
1	C85	TC-6	Capacitor, Variable, Plate 5-30	2.50
1	C86	TC-6	Capacitor, Variable, Load 20-300	2.50
1	C81	TC-6	Capacitor, Electrolytic, 1000 uuf, SKV, plate coup.	2.50
1	C3	CPS-1	Capacitor, Electrolytic, 1000 ufd @ 25V	2.40
3	C29, 51, 55	TC-2	Capacitor, electrolytic, 250 ufd @ 50V	1.10
1	-----	TC-2/6	Carton, complete	2.50
1	R11	SC-6	Control, PC type, 5K	.40
1	R2	TC-2	Control, PC type, 1K, drive	.40
1	R33	TC-2	Control, PC type, 20K, AGC	.40
1	R10	TC-6	Control, PC type, 1K, drive	.40
1	R38	TC-2	Control, with Switch, rel output	2.00
1	R43	TC-6	Control, with Switch, rel output	2.00
1	R25	TC-6	Control, 30K, EX. bias	.60
1	R26	TC-6	Control, 30K, Bias adj	.60
1	R23	TC-2	Control, 5K, bias	.60
3	L10, 11, 12	TC-6	Choke, plate, parasitic	.50
1	-----	SC-2	Crystal, 43.333	5.00
1	-----	SC-2	Crystal, 43.666	5.00
1	-----	SC-6	Crystal, 36.0	5.00
1	-----	SC-6	Crystal, 36.5	5.00
1	-----	SCC-1	Crystal, 100KC	7.50
--	-----	Various Diodes:		
			1N483	.50
			1N4148	.50
			B5G5	.55
			1N714	1.20
			1N270	.55



QTY	SYMBOL	USED ON	ITEM	PRICES EACH
1	F1	CPS-1	Fuse, 0.1 amp.	\$ .22
1	F1	TC-2	Fuse, 1/2 amp., pigtail	.22
1	-----	TC-6	Fuse, #26, 3"	.05
1	1C-1	SCC-1	Integrated circuit, 1C923	1.50
1	1C-2	SCC-1	Integrated circuit, 1C914	1.50
4	-----	TC-2	Knobs, bar type	.30
4	-----	TC-6	Knobs, bar type	.30
1	-----	TC-6	Knobs, bar, small (drive)	.25
1	-----	TC-6	Knobs, push-on type	.15
1	-----	TC-2	Knobs, push-on type	.15
1	-----	CC-1	Knobs, selection	.80
5	-----	CC-1	Knobs, screw-on type for push switch	.25
1	-----	TC-2	Meter, plate	5.25
1	-----	TC-6	Meter, plate	5.25
1	-----	TC-2	Panel	6.00
1	-----	TC-6	Panel	6.00
1	K1	TC2/6	Relay, antenna	6.00
1	S1	SC-2	Switch, slide	.20
1	S1	SC-6	Switch, slide	.20
1	S1	SCC-1	Switch, slide	.20
1	S1	CPS-1	Switch, slide	.20
1	S2	TC-6	Switch, range, complete	3.30
--	-----	-----	Individual phenolic wafers for above	.65
1	S1	TC-6	Switch, function	3.80
1	S1	TC-2	Switch, function	5.25
1	S2	TC-2	Switch, range, complete	7.00
--	-----	-----	Individual ceramic wafers for above	1.00
1	S1	CC-1	Switch, selector	3.60
--	-----	Various Transistors:		
			T1S-34	1.00
			2N3394	.30
			2N3663	.54
			2N4125	.52
			2N3877	.55
--	Various	TC-2	Trimmers, specify	.40
--	Various	TC-6	Trimmers, specify	.40
--	Various	SC-2	Trimmers, specify	.40
--	Various	SC-6	Trimmers, specify	.40
1	C1	SCC-1	Trimmers, 5-25	.40
1	L1	CPS-1	Transformer, power	2.50
1	V4	TC-2	Tube, 8643	38.10
2	V1, 2	TC-2	Tube, 6EJ7	2.13
1	V3	TC-2	Tube, 7558	3.80
3	V4, 5, 6	TC-6	Tube, 6JB6	4.00
1	V2	TC-6	Tube, 6GK6	1.70
1	V1	TC-6	Tube 6EJ7	2.13
1	V3	TC-6	Tube, 12AV6	1.41

For your convenience in connecting and reconnecting cables to your Drake equipment we have enclosed a card of cable markers. The name on each marker corresponds to the name of a connector or jack on the equipment. Wrap the marker around the cable; bring the ends of the marker together to form a "flag". Each end of every cable can be marked with the Model of Drake equipment to which it goes and the name of the connector. Since one card of markers is used for several types of equipment, there will be extra markers; these may be discarded.

It is a convenient device for connecting and  
it has a small coil of wire. The name on each  
to the name of a country. The first is "Japan". Each one of  
cable is marked with the name of the country to which it goes and  
the name of the country. Since only a few  
of the world, the name of the country to which it goes and



INJ	IF OUT	ANT	CAL IN	INJ OUT	IF OUT	ANT	CAL IN	A	AGC	RY	B	INJ	EXC IN	AUX	AUX	CAL	AUX RY	EXC OUT	HF ANT	HF RCVR	CONV IF	RCVR	RCVR	
SC-6	SC-6	SC-6	SC-6	SC-2	SC-2	SC-2	SC-2	TC-6	TC-6	TC-6	TC-6	TC-6	TC-6	TC-6	TC-6	TC-6	TC-6	TC-6	TC-6	TC-6	TC-6	TC-6	TC-2	
INJ	IF OUT	ANT	CAL IN	INJ OUT	IF OUT	ANT	CAL IN	A	AGC	RY	B	INJ	EXC IN	AUX	AUX	CAL	AUX RY	EXC OUT	HF ANT	HF RCVR	CONV IF	RCVR	RCVR	
A	AGC	RY	B	INJ	EXC IN	AUX	AUX	CAL	AUX RY	EXC OUT	HF ANT	HF RCVR	CONV IF	RCVR	HF ANT	EXTRA	6MTR	2MTR	HF	EXT SW	A	B	EXC OUT	
TC-2	TC-2	TC-2	TC-2	TC-2	TC-2	TC-2	TC-2	TC-2	TC-2	TC-2	TC-2	TC-2	TC-2	CC-1	CC-1	SCC-1	SCC-1	SCC-1	SCC-1	SCC-1	PA DIS	PA DIS		
A	AGC	RY	B	INJ	EXC IN	AUX	AUX	CAL	AUX RY	EXC OUT	HF ANT	HF RCVR	CONV IF	RCVR	HF ANT	EXTRA	6MTR	2MTR	HF	EXT SW	B	B	EXC OUT	

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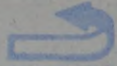
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